ABSTRACT OF THE DISCLOSURE

There are equipped a first recurrent neural network formed by connecting plural nodes so as to have a loop in which the output from one node is input to another node in accordance with a predetermined coupling weight coefficient. Meanwhile, the output of at least one node is fed back to the node concerned or another node, and an optimizing unit for determining the optimum solution of the coupling weight coefficient in the first recurrent neural network based on a learning rule using a hereditary algorithm. In this case, the first recurrent neural network outputs a first parameter indicating a motion state of a vehicle based on predetermined input information, thereby functioning as a vehicle motion model.